Safety data sheet for chemical products

1. Chemical Product and Company Identification

Chemical product name: Alcohol
Fermented alcohol: 99 degree of alcoholicity (first-class)
Synthetic alcohol: 99 degree of alcoholicity

Supplier name:
ALCOHOL ENTERPRISE HEAD OFFICE,
NEW ENERGY AND INDUSTRIAL TECHNOLOGY DEVELOPMENT ORGANIZATION
Address: 10-2, 1-chome, Nishi-Shimbashi, Minato-ku, Tokyo (Tokyo Office)
Department: Marketing Dept.
Tel: 81-3-5511-8841 Fax: 81-3-5511-8388

2. Composition, Information on Ingredients

Chemical name: Ethanol
Synonyms:
Ethyl alcohol, Methylcarbinol, Ethyl hydroxide, Ethyl hydrate, Spirits of wine
Content: not less than 99.5% alcohol by volume
Chemical formula: C_2H_5OH
Molecular mass: 46.07
CAS: ethanol No.64-17-5
Official gazette reference No. (under the Law concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances, and the Law concerning Industrial Safety and Health): (2)-202
Hazardous and harmful ingredients: Not contained

3. Hazards Identification

Classification of chemical product: Flammable liquid
Physical and chemical hazardousness:
This is a flammable liquid and the vapor becomes explosive when mixed with specific quantity of air.
Environmental effects: High biodegradability
Harmfulness for human health:
This is regarded as a relatively harmless solvent for industrial use, but acts as an anesthetic by inhalation of its vapor. Repeated exposure causes irritation to mucous membranes, dizziness, hypesthesia, headache, etc.
Particular hazardousness and harmfulness: Not applicable

4. First Aid Measures

Inhalation:
Immediately remove affected person into fresh air and keep at rest. Seek immediate medical treatments if affected severely.
Skin contact:
Immediately remove contaminated clothes and wash the affected region with running water. Clean off fully with soap.
Eye contact:
After washing with large amount of water for at least 15 minutes, seek immediate medical treatments by an ophthalmologist.
Ingestion:
After rinse the mouth with water again and again, give several cups of water to drink for diluting the effect and induce vomiting with fingers inserted into the throat if possible. Seek immediate medical treatments.

5. Fire Fighting Measures

Extinguishing media:
Water, dry chemical, alcohol-resistant foam and carbon dioxide
Fire fighting ways:

In the initial stage of fire, extinguish the fire with large amount of water injection, or with fire extinguishers using dry chemical, carbon dioxide, etc. In case of big fire, interrupt from the air by foam (alcohol-resistant foam).

6. Accidental Release Measures

General information:

- For avoiding physical contact with high concentration of material, put on appropriate protection such as protective glasses, gas mask and hose mask.
- Immediately remove adjacent ignition sources because this has permeability and flammability.

Methods of removal

- In case of small amount, immediately wash away the leaky area with plenty of water.
- In case of large amount, collect leaking and spilling liquid in sealable containers as much as possible. Wash away remainder with plenty of water.

7. Handling and Storage

Handling:

- Avoid contact with or pouring into flammable or other possible fire sources. Do not vaporize or heat up it.
- Make the whole electrical equipment in facilities for handling and storing with explosion-proof constructions. In places where possibly causes static electricity by alcohol flowage or others, set up equipment for effectively removing it.
- Always keep facilities for handling in order and do not lay flammable or oxidative materials in or near the facilities.

Storage:

- Store in a storage facility under the Fire Defense Law. Keep the place well ventilated to prevent the vapor from retention. Also the materials less than designated volume should be kept away from ignition sources and other dangerous areas, stored in cool and dark places well ventilated, at appropriate temperature and humidity, and shielded from light.
- Do not store the material mixed with hazardous materials designated as Category 1 and Category 6 under the Fire Defense Law. In principle, do not store it mixed with nonhazardous materials but in case of storing with flammable solids or flammable liquid other than hazardous materials, by way of exception, store each of them in a mass and place the masses at intervals of one meter or more each other.

8. Exposure Controls, Personal Protection

Facility measures:

It is important to use a closed system. Use explosion-proof lighting. Handling should be made in places with no ignition sources and well ventilated.

Occupational exposure limits:

ACGIH (1996): TWA 1000 ppm (1880 mg/m^3)

Protective equipment:

Put on rubber gloves, rubber apron and protective footwear in ordinary circumstances. In places with high concentration of material, put on rubber gloves, rubber apron, protective footwear, protective glasses and gas mask.

Working clothes: Put on antistatic clothes.

9. Physical and Chemical Properties (as alcohol 100%)

Physical state: Liquid
Color: Transparent and colorless
Odor: Characteristic redolence
Sapor: Stimulating taste
pH: Not applicable
Boiling point: 78.32°C (101.325 kPa)
Melting point: -114.5°C

Flash point: 13°C
Ignition temperature: 439°C
Explosive limits:
From lower point of 3.3 vol% to upper point of 19.0 vol% (in the air).
Vapor pressure: 5.878 kPa (at 20°C)
Relative vapor density (air = 1): 1.59
Density: 0.78493 g/cm^3 (at 25°C)
Solubility in solvents: Well dissolves in water and ether.
Octanol/water partition coefficient: -0.30 (logPow)

10. Stability and Reactivity (as alcohol 100%)

Stability:
Freely stable, not form hazardous or harmful materials by decomposition in ordinary handling conditions.
Reactivity:
The substance violently reacts with strong oxidants such as nitric acid, silver nitrate, mercury nitrate and magnesium perchlorate, causing fire and explosion hazard.

11. Toxicological Information (as alcohol 100%)

<Acute toxicity>
- Oral, in humans: LDL_0: 1400 mg/kg, affects behaviors and gastrointestinal systems (causes nausea).
- Oral, in rats: LD_{50}: 7060 mg/kg, affects respiratory systems.

<General toxicity>
- Inhalation, in rats: LC_{50} 20000 ppm/10h, toxicity unassessed.
- Oral, in humans (male): TDL_0: 700 mg/kg, affects behaviors (psychophysiologically)
- Injection, in rats: LD_{50}: 1440 mg/kg, affects respiratory systems.
- Injection, in dogs: LDL_0: 1600 mg/kg, causes ataxia and affects respiratory systems.
- Intra-abdominal, in mammals: LD_{50}: 4300 mg/kg, causes ataxia

<Mutagenicity>
- Micronucleus, in mice (abdominal cavity): 1240 mg/kg/48 hours.

<Irritativeness>
- Skin, in rabbits: 400 mg, open, causes mild irritation.
- Skin, in rabbits: 500 mg/24 hours, causes severe irritation.
- Eyes, in rabbits: 100 mg/24 hours, causes moderate irritation.

<Carcinogenicity>
- Oral, in mice: TDL_0: 320 mg/kg/50 weeks, toxicity unassessed.

<Fecundity>
- Inhalation, in rats: TCL_0: 20000 ppm/7 hours, causes poor development on day 1 to 22 of gestation.
- Oral, in rats: TDL_0: 44 g/kg, causes poor development on day 7 to 17 of gestation.

12. Ecological Information

<Degradability>
- Calculated oxygen demand: 2.10 mg/L
- BOD_5 0.93 to 1.67 mg/L
- COD 1.99 to 2.11 mg/L
- Inhibition of bacterial nitrification: Inhibits 50% of ammonia oxidation by Nitrosomonas in 4100mg/L.

<Ecological toxicity>
- Orange fin: LC_{50}: 11.2 g/L/24 hours
- A kind of carp: LC_{50}: 18 to 13.4 g/L/96 hours
- Creek-chub: LC_{50}: 7 g/L/24 hours

- Guppy: LC_{50}: 11 g/L/7 days

13. Disposal Considerations

- Remaining wastes shall be burned up in an incinerator by means of spraying.
- When discarding used containers or pipes, etc., they shall be rinsed with water in advance.
- Disposal shall be in accordance with descriptions in the column of "Precautions to be taken during handling and storing", and with other general cautions to flammable liquids.

14. Transport Information

- UN Hazard Class: 3 (flammable liquid)
- UN No.: 1170 ethanol
- Fire Defense Law:
  Category 4 flammable liquid, 3. a kind of spirits in Attached Table (designated volume: 400L)
- Aviation Act:
  Article 194 in Regulation of Aviation Act 3. flammable liquid (flash point: not more than 60.5°C)
- Port Regulations Law :
  Article 12 in Regulation of Port Regulations Law 5. a kind of flammable liquid (middle) in Attached Table on Notification of Hazardous Materials
- Law relating to the Prevention of Marine Pollution and Maritime Disaster:
  Ordinance of Law relating to the Prevention of Marine Pollution and Maritime Disaster 13. Non-harmful material in Attached Table 1-2
- Transportation shall be in accordance with descriptions in the column of "Precautions to be taken during handling and storing". Mixed loading with hazardous materials designated as Category 1 and Category 6 is placed under a ban according to the Fire Defense Law.

15. Regulatory Information

- Fire Defense Law:
  Category 4 flammable liquid, 3. a kind of spirits in Attached Table (designated volume: 400L)
- Alcohol Operation Law
- Industrial Health and Safety Law:
  Ordinance of Industrial Health and Safety Law 4. Flammable substances in Attached Table 1 Hazardous Materials.
  Ordinance of Industrial Health and Safety Law Reportable Harmful Material to notify the name, etc. 62 in Attached Table 9
- Ordinance on Hazardous Material Transportation by Ship and its Storage:
  a kind of flammable liquids.

*This product is not applicable to "Law concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management" (PRTR) .

16. Other Information

<Reference>

Japan Bioindustry Association (a juridical foundation): Alcohol Handbook 9th Edition (1997)
The Chemical Society of Japan: Handbook of Chemical 4th Revised Edition, Maruzen (1993)
The Chemical Daily Co., Ltd.: 13700 Chemical Products
The Chemical Daily Co., Ltd.: International Chemical Safety Cards (ICSC) Japanese Version 3rd Series (1997)
Ministry of International Trade and Industry: Official Gazette (December 28, 1993)